

University of California
Tobacco-Related Disease Research Program

ABSTRACT OF RESEARCH PROPOSAL

Interaction of Occupational Aerosols and Tobacco Smoke.
Title of Research Project (do not exceed 60 spaces)

William C. Hinds, ScD
Principal Investigator

Department of Environmental Health Sciences UCLA School of Public Health
Department and Institution

The study will evaluate a plausible explanation of the health effect synergism observed for simultaneous exposure to tobacco smoke and particulates in occupational environments. While most smoking induced lung cancers originate in the respiratory airways, most of the tobacco tar deposits in the alveolar region of the lungs. Ambient particles in the 1-10 μm size range become coated with tar as they pass through a cigarette during smoking. These particles will deposit preferentially in the airways and greatly increase the amount of tar deposited in that region. This process will also occur to a lesser extent for environmental tobacco smoke in dusty atmospheres.

The chemistry and physics of the interaction between ambient particles and tobacco smoke will be evaluated to provide estimates of the extent to which occupational exposures modify the total, regional, and local tissue dose of tar in the lungs. The study will characterize the penetration of ambient particles through cigarettes during smoking, the extent to which these particles become coated with tar, and the effect they have on regional dose of tar.

Monodisperse cesium sulfate particles will be generated using a vibrating orifice monodisperse aerosol generator. Cigarettes will be smoked in a chamber containing the cesium sulfate aerosol. The cesium sulfate particles will acquire a coating of tar as they pass through the cigarette. After passing through the cigarette the smoke particles will be aerodynamically separated with a high resolution cascade impactor into two fractions, one containing unmodified tobacco smoke particles and one containing only coated cesium sulfate particles. Tar will be analyzed using uv absorbance and the cesium sulfate particles will be analyzed by inductively coupled plasma emission analysis for cesium an element found only in minute amounts (<0.2 ng/cig.) in cigarette smoke. Environmental tobacco smoke experiments will be conducted by mixing cigarette smoke with cesium sulfate particles in a chamber, allowing them to age, and sampling and analyzing for tar and cesium as described above. These results will be used in a deposition model to predict the increase in airway deposition of tar that occurs as a result of the presence of ambient dust particles.

University of California
Tobacco-Related Disease Research Program

Budget

Year: 1

(Please submit a separate budget page for any subsequent years)

1) Personnel (list all professional and support personnel to be associated with the project and paid by the project)

Name	Title of Position	% Time on Project	Salary Requested	Benefits	Total
W. Hinds (Acad.yr)	PI	10%	-0-	-0-	-0-
W. Hinds (Summer)	PI	1.5 mo @ 100%			
TBA	SRA II	50%			
T. Kuo	GSR II*	50%			
TBA	GSR II(ICP)*	15%			
TBA	Sec II	11.9%			

REDACTED

*GSR II - Medical coverage insurance
\$173.25 per quarter for 3 quarters.

Total (All Personnel): \$ REDACTED

2) Supplies and Expenses (list general categories)

Lab Supplies	\$1,900
Chemicals	500
Office and Computer, FAX, Phone	290
Machine Shop Services (for equip. fabrication)	2,600

Total (All Supplies and Expenses): \$ 5,290

3) Equipment

a) Sierra Instruments Model 210 Cascade Impactor	\$8,800
b) Components for fabrication of smoking machine and chamber (motor, controller, cam timer, air cylinders, solenoid valves, etc.)	2,400
Total Equipment: \$ <u>11,200</u>	

4) Domestic Travel

One scientific meeting	
air fare	\$800 RT
per diem	125/day x 5 days = 625

Total Travel: \$ 1,425

Total Requested for This Project Year
For Project Operation: \$ \$71,109

University of California
Tobacco-Related Disease Research Program

Budget continued

Year: 1

5) Indirect Costs (University of California and California State University
applicants may not apply for indirect costs)

Total indirect costs: \$ 0.00

Total requested for This
Project Year for Project
Operations plus Indirect
Costs: \$ 71,109

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University of California
Tobacco-Related Disease Research Program

Budget

Year: 2

(Please submit a separate budget page for any subsequent years)

1) Personnel (list all professional and support personnel to be associated with the project and paid by the project)

<u>Name</u>	<u>Title of Position</u>	<u>% Time on Project</u>	<u>Salary Requested</u>	<u>Benefits</u>	<u>Total</u>
W. Hinds (Acad, yr)	PI	10%			
W. Hinds (Summer)	PI	1.5 mo @ 100%			
TBA	SRA II	50%			
T.L. Kuo	GSR II *	50%		REDACTED	
TBA	GSR II(ICP)*	15%			
TBA	Sec II	9.6%			

*GSR II - Medical coverage insurance
\$181.91 per quarter for 3 quarters.

R

Total (All Personnel): \$ REDACTED

2) Supplies and Expenses (list general categories)

Lab Supplies	\$ 750
Chemicals	400
Office and Computer	360
Machine Shop Services	200
ICP Maintenance	1,000

Total (All Supplies and Expenses): \$ 2,710

3) Equipment

None

Total Equipment: \$ 0

4) Domestic Travel

One scientific meeting	
Air fare	\$850 RT
Per diem 5 x 130/day	650

Total Travel: \$ 1,500

Total Requested for This Project Year
For Project Operation: \$60,096

University of California
Tobacco-Related Disease Research Program

Budget continued

Year: 2

5) Indirect Costs (University of California and California State University
applicants may not apply for indirect costs)

Total indirect costs: \$ 0

Total requested for This
Project Year for Project
Operations plus Indirect
Costs: \$ 60,096

University of California
Tobacco-Related Disease Research Program

Budget

Year: 3

(Please submit a separate budget page for any subsequent years)

1) Personnel (list all professional and support personnel to be associated with the project and paid by the project)

Name	Title of Position	% Time on Project	Salary Requested	Benefits	Total
W. Hinds (Acad. yr)	PI	10%			
W. Hinds (Summer)	PI	1.5 mo @ 100%			
TBA	SRA II	50%			
T.L. Kuo	GSR II*	50%			
TBA	GSR II(ICP)*	15%			
TBA	Sec II	9.5%			

REDACTED

*GSR II - Medical coverage insurance
\$191.00 per quarter for 3 quarters.

R

Total (All Personnel): \$ REDACTED

2) Supplies and Expenses (list general categories)

Lab Supplies	\$ 700
Chemicals	400
Office and Computer	380
ICP Maintenance	1,000

Total (All Supplies and Expenses): \$ 2,480

3) Equipment

None

Total Equipment: \$ 0

4) Domestic Travel

One scientific meeting	
Air fare	\$900 RT
Per diem 5 x 135/d	675

Total Travel: \$ 1,575

Total Requested for This Project Year
For Project Operation: \$ 62,873

University of California
Tobacco-Related Disease Research Program

Budget continued

Year: 3

5) Indirect Costs (University of California and California State University
applicants may not apply for indirect costs)

Total indirect costs: \$ 0

Total requested for This
Project Year for Project
Operations plus Indirect
Costs: \$ 62,873

University of California
Tobacco-Related Disease Research Program

Budget Justification

PERSONNEL

All salary supports have been computed based on the established guidelines of the University of California.

W. Hinds, Sc.D. (P.I.) will devote 10% of time to this study at no charge during the 9-month academic year 1, 2 and 3. He will devote 100% of his time during the 1.5 summer months for which he will receive compensation in the form of 100% of 1.5 summer months in Years 1, 2 and 3.

W. Hinds will be responsible for the scientific and administrative aspects of the project. Fringe Benefits have been calculated at 10% (including FICA) in Year 1, 2 and 3. Salary range adjustments for Year 1, 2 and 3 were calculated at 5%. We have included the progression to the next professorial level for Year 2. Retirement benefits allowance have been included in the calculations in Year 1, 2 and 3.

Staff Research Associate II will devote 50% time to this project during the 12 months for which salary support has been requested. The SRA II will assist in debugging and calibrating equipment to conduct experiment, analyze samples and data. Fringe Benefits were calculated at 27% for Year 1, 28% for Year 2 and 29% for Year 3. Salary range adjustments were calculated for Year 1, 2, and 3 at 5%.

T.Kuo, Graduate Student Researcher II (student) will devote 50% time to this project during the 12 months for which salary support has been requested in Year 1, 2 and 3. The GSR II will assist in debugging and calibrating equipment to conduct experiment, analyze samples and data. Fringe Benefits were calculated at 2.14% for Year 1, 2, and 3. Salary range adjustments were calculated for Year 1, 2, and 3 at 5%. Per the university regulations the GSR II's mandatory medical insurance has been included in Year 1 and in Year 2 and 3 a 5% increase has been included.

Graduate Student Researcher II (ICP) (student) will devote 15% time to this project during the 12 months for which salary support has been requested in Year 1, 2 and 3. The GSR II will run ICP samples. Fringe Benefits were calculated at 2.14% for Year 1, 2, and 3. Salary range adjustments were calculated for Year 1, 2, and 3 at 5%. Per the university regulations the GSR II's mandatory medical insurance has been included in Year 1 and in Year 2 and 3 a 5% increase has been included.

Secretary II will devote 11.9% time to this project during the 12 months for which salary support has been requested. The Secretary will prepare correspondence, reports, etc. Fringe Benefits were calculated 27% in Year 1, 28% in Year 2 and

29% in Year 3. Salary range adjustments were calculated for Year 1, 2, and 3 at 5%.

SUPPLIES & EXPENSES

Lab supplies include: glassware, filters, digesters (Parr bombs), fittings, VOMAG orifices, cigarettes, tubing, clamps, lab hardware.

Chemicals includes cesium sulfate, solvents, extraction acids. Machine shop services is for fabrication of equipment for experimental set-up. Partial maintenance of ICP not needed for 1st year because the ICP will be under warranty.

EQUIPMENT

- a) The cascaded impactor is one of two needed. We already have one.
- b) Components for experimental equipment are listed as equipment because they will be assembled into the experimental set-up. Includes: variable speed motor, cam timer, air cylinders, solenoid valves, filter holders, controller, etc.

TRAVEL

Travel to one scientific meeting each year. Location unknown at this time. Second and third year will be to present a research paper on project.

INDIRECT COST RATES

Indirect costs are not allowed.

Financial Support (for each Professional)

Investigator: <u>William C. Hinds</u>	<u>Interaction of Occupational Aerosols and Tobacco Smoke</u>
Name	Title of Project

NIOSH	Respirator Model for Particulates	\$ 88,794	9/1/89-8/31/90	PI	10%
NIOSH	Industrial Hygiene Training Grant (subcontract with USC)	\$101,481	7/1/89-6/30/90	PI	15%
Los Alamos	Filter Performance Study	\$ 15,000	1/1/90-12/31/90	PI	10%

NIOSH	Respirator Model for Particulates	\$ 67,228	9/1/90-8/31/91	PI	10%
NIOSH	Industrial Hygiene Training Grant (Subcontract with USC)	\$ 1,116,782	7/1/90-6/30/94	PI	20%

NO

NIOSH 5 RO1 OH01595 Respirator Performance Model for Particulates

The overall objective of this grant is to extend our understanding of the effect of particle size on the performance of air-purifying respirators for protection against particulate exposures. This is accomplished through experimental measurement of filter, exhalation valve, and facial seal leak performance as a function of particle size and flow rate and the use of these data in a computer model to predict overall performance for a respirator based on QNFT measured leakage, airborne particle size distribution, and the work rate of the wearer. This study has no direct relationship to the proposed study.

Los Alamos MRUC-90-4-C-84 Filter Performance Study

The objective of this project is to conduct experimental and theoretical investigation of the performance of high efficiency air filters (HEPA) operated at low flow rates. Some experimental data suggest that HEPA filters have much lower collection efficiency than predicted at these conditions. If this is so it has important health implications because these filters are widely used for health protection. A second objective is to develop quality assurance testing equipment to test high efficiency filters at low flow rate conditions. This study has no direct relationship to the proposed study.

University of California
Tobacco-Related Disease Research Program

Biographical Sketch (for each Professional)

William C. Hinds	Professor
Name	Title/Role in this Project

Education (begin with baccalaureate and include postdoctoral training)

Institution and Location	Field of Study	Degree	Year
Cornell Univ.; Ithaca, NY	Mech. Engineering	BME	1962
Harvard Univ.; Boston, MA	Air Pollution	MS in Hyg.	1969
Harvard Univ.; Boston, MA	Env. Health	ScD	1972

Professional Experience (begin with present position)

1989-Pres.	Chair, Dept. Environmental Health Sciences	UCLA School of Public Health
1987-89	Division Head, Environmental Health Sciences	UCLA School of Public Health
1986-Pres.	Professor of Environmental Health Sciences	UCLA School of Public Health
1982-86	Associate Professor of Public Health	UCLA School of Public Health
1980-82	Associate Professor of Environmental Health Engineering	Harvard University
1973-80	Assistant Professor Environmental Health Engineering	Harvard University

Publications

(On an additional page, list in chronological order the titles and complete references of all articles published during the last 5 years; list all earlier publications that are pertinent to this application. (Use no more than one complete page for publications.)

Selected publications in past five years

Hinds, W., Aerosol Technology: Properties, Behavior, and Measurement of Airborne Particles (Japanese edition), Inoue Shoin, Ltd., Tokyo, Japan 1985.

Hinds, W., Liu, W.-C.V., Froines, J.R., "Particle Bounce in a Personal Cascade Impactor: A Field Evaluation," Am. Ind. Hyg. Assoc. J., **46**, 517-523 (1985).

Hinds, W., and Kraske, G., "Performance of PMS Model LAS-X Optical Particle Counter," J. Aerosol Science, **17**, 67-72 (1986).

Froines, J.R., Liu, V., Hinds, W., and Wegman, D.H., "Effect of Aerosol Size on the Blood Lead Distribution of Industrial Workers," Am. J. Industrial Med., **9**, 227-237 (1986).

Phalen, R.F., Hinds, W.C., John, W., Liou, P.J., Lippmann, M., McCawley, M.A., Raabe, O.G., Soderholm, S.C., and Stuart, B.O., "Rationale and Recommendations for Particle Size-selective Sampling in the Workplace," Applied Ind. Hyg. J., **1**, 3-14 (1986).

Froines, J.R., Hinds, W.C., Duffy, R.M., LaFuenté, E.J., and Liu, W.C.V., "Exposure of Firefighters to Diesel Emissions in Fire Stations," Am. Ind. Hyg. Assoc. J., **48**, 202-207 (1987).

Hinds, W.C. and Kraske, G. K., "A Bench-Scale Aerosol Test Chamber," Applied Industrial Hygiene, **2**, 13-17 (1987).

Hinds, W.C. and Kraske, G., "Performance of Dust Respirators with Facial Seal Leaks: I. Experimental," Am. Ind. Hyg. Assoc. J., **48**, 836-841 (1987).

Hinds, W.C. and Bellin, P., "Performance of Dust Respirators with Facial Seal Leaks: II. Predictive Model," Am. Ind. Hyg. Assoc. J., **48**, 842-847 (1987).

Hinds, W.C., "Basis for Particle Size-Selective Sampling for Wood Dust," Appl. Ind. Hyg., **3**, 67-72 (1988).

Hinds, W.C., and Bellin P., "Effect of Facial-seal Leaks on Protection Provided by Half-mask Respirators," Appl. Ind. Hyg., **3**, 158-164 (1988).

Other relevant publications

Hinds, W.C., and First, M.W., "Concentrations of Nicotine and Tobacco Smoke in Public Places," N.E.J. Med., **292**, 844 (1975).

Hinds, W.C., "Size Characteristics of Cigarette Smoke," Amer. Ind. Hyg. Assoc. J., **39**, 48-54 (1978).

Hinds, W., First, M.W., Huber, G.L., and Shea, J.W., "A Method for Measuring Respiratory Deposition of Cigarette Smoke During Smoking," Amer. Ind. Hyg. Assoc. J., **44**, 113-118 (1983).

UNIVERSITY OF CALIFORNIA, LOS ANGELES

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SANTA BARBARA • SANTA CRUZ

1TR 0007 - 01

OFFICE OF CONTRACT AND GRANT ADMINISTRATION
405 HILCARD AVENUE
LOS ANGELES, CALIFORNIA 90024-1406

February 20, 1990

Tobacco-Related Disease Research Program
Office of Health Affairs-Office of the President
University of California, 764 University Hall
2199 Addison Street
Berkeley, CA 94720

SUBJECT: Proposal Submission

Ladies and Gentlemen:

On behalf of the Los Angeles campus, I am pleased to submit the enclosed proposal entitled "Interaction of Occupational Aerosols and Tobacco Smoke". This project will be conducted under the direction of Professor William Hinds in the UCLA School of Public Health between July 1, 1990 and June 30, 1993. We are requesting funds in the amount of \$194,078 for this period.

Your favorable consideration of this proposal would be appreciated. If you have any questions of a technical nature, please contact Professor Hinds at (213) 825-7152. If you have any questions of an administrative nature, please contact the undersigned at (213) 825-0609.

Sincerely,

A handwritten signature in black ink, appearing to read "Philip E. Costic", written over a circular stamp or seal.

Philip E. Costic
Senior Contract and Grant
Officer

OJB0220B

Enclosures: Original plus 5 copies referenced proposal

cc w/o encl: Professor William Hinds
Ms. Jayne Rosenthal

2025792761

1990 Application # ITR 0007 - 01

TOBACCO-RELATED DISEASE RESEARCH PROGRAM
University of California
RESEARCH AWARD APPLICATION

Check one:

☒ New Application
☐ Renewal

Circle Duration of proposed project:

(1) (2) (3) years

Amount requested for
1990-91: \$71,109

Title of Research Project (do not exceed 60 spaces)

Interaction of Occupational Aerosols and Tobacco Smoke

Principal Investigator:

William C. Hinds, ScD
Name (first, last, degree(s))

Professor
Position/Title

Mailing address of Principal Investigator:

Environmental Health Science
School of Public Health
10833 Le Conte Avenue
Los Angeles, CA 90024-1772

(213) 825-7675
Department telephone

(213) 825-7152
Office telephone

(213) 825-7104
Message telephone

(213) 825-8440
Fax telephone

RECEIVED

FEB 21 1990

Ans'd.....

Applicant Institution

Mailing Address of Official signing for Applicant Organization

Philip Costic
Name

Senior Contract and Grants Officer
Title

Office of Contracts and Grants Administration; 1400 Ueberroth Building
Address

Los Angeles, CA
City

State

90024-1406
Zip Code

Co-Investigators (Professional)

Name (first, last, degree(s))

Position/Title

Mailing address of Co-Investigator:

Department telephone

Office telephone

Message telephone

Fax telephone

Reviews and Approvals

(A) Human Subjects

(x) Does not apply
() Approval attached
() Review pending;
expected date of
approval_____

(B) Animal Subjects

(x) Does not apply
() Approval attached
() Review pending;
expected date of
approval_____

(C) Biohazards

(x) Does not apply
() Approval attached
() Review pending;
expected date of
approval_____

University of California
Tobacco-Related Disease Research Program

Verifications:

(A) Applicant:

I verify that the information that I have provided in this application is correct and complete. If given an award, I will abide by all relevant policies and procedures of the University of California Tobacco-Related Disease Research Program, including the provision of required progress reports and other project-related reports.

William C. Hind 2/13/90
Signature Date

(B) Contracts and Grants/Authorized Fiscal Official:

I certify that the statements made herein are true and complete to the best of my knowledge and I accept the obligation to comply with the relevant terms and conditions of the grant as established by the Tobacco-Related Disease Research Program.

Philip Costic 2/20/90 Philip Costic, Senior Contract and Grants Officer
Signature Date Name Title

University of California
Tobacco-Related Disease Research Program

ABSTRACT OF RESEARCH PROPOSAL

Interaction of Occupational Aerosols and Tobacco Smoke
Title of Research Project (do not exceed 60 spaces)

William C. Hinds, ScD
Principal Investigator

Department of Environmental Health Sciences UCLA School of Public Health
Department and Institution

The study will evaluate a plausible explanation of the health effect synergism observed for simultaneous exposure to tobacco smoke and particulates in occupational environments. While most smoking induced lung cancers originate in the respiratory airways, most of the tobacco tar deposits in the alveolar region of the lungs. Ambient particles in the 1-10 μm size range become coated with tar as they pass through a cigarette during smoking. These particles will deposit preferentially in the airways and greatly increase the amount of tar deposited in that region. This process will also occur to a lesser extent for environmental tobacco smoke in dusty atmospheres.

The chemistry and physics of the interaction between ambient particles and tobacco smoke will be evaluated to provide estimates of the extent to which occupational exposures modify the total, regional, and local tissue dose of tar in the lungs. The study will characterize the penetration of ambient particles through cigarettes during smoking, the extent to which these particles become coated with tar, and the effect they have on regional dose of tar.

Monodisperse cesium sulfate particles will be generated using a vibrating orifice monodisperse aerosol generator. Cigarettes will be smoked in a chamber containing the cesium sulfate aerosol. The cesium sulfate particles will acquire a coating of tar as they pass through the cigarette. After passing through the cigarette the smoke particles will be aerodynamically separated with a high resolution cascade impactor into two fractions, one containing unmodified tobacco smoke particles and one containing only coated cesium sulfate particles. Tar will be analyzed using uv absorbance and the cesium sulfate particles will be analyzed by inductively coupled plasma emission analysis for cesium an element found only in minute amounts (<0.2 ng/cig.) in cigarette smoke. Environmental tobacco smoke experiments will be conducted by mixing cigarette smoke with cesium sulfate particles in a chamber, allowing them to age, and sampling and analyzing for tar and cesium as described above. These results will be used in a deposition model to predict the increase in airway deposition of tar that occurs as a result of the presence of ambient dust particles.

University of California
Tobacco-Related Disease Research Program

Budget Justification

PERSONNEL

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W. Hinds, Sc.D. (P.I.) will devote 10% of time to this study at no charge during the 9-month academic year 1, 2 and 3. He will devote 100% of his time during the 1.5 summer months for which he will receive compensation in the form of 100% of 1.5 summer months in Years 1, 2 and 3.

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Staff Research Associate II will devote 50% time to this project during the 12 months for which salary support has been requested. The SRA II will assist in debugging and calibrating equipment to conduct experiment, analyze samples and data. Fringe Benefits were calculated at 27% for Year 1, 28% for Year 2 and 29% for Year 3. Salary range adjustments were calculated for Year 1, 2, and 3 at 5%.

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- a) The cascaded impactor is one of two needed. We already have one.
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TRAVEL

Travel to one scientific meeting each year. Location unknown at this time. Second and third year will be to present a research paper on project.

INDIRECT COST RATES

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Financial Support (for each Professional)

Investigator:	Interaction of Occupational Aerosols and Tobacco Smoke
Name	Title of Project
William C. Hinds	

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NIOSH 5 RO1 OH01595 Respirator Performance Model for Particulates

The overall objective of this grant is to extend our understanding of the effect of particle size on the performance of air-purifying respirators for protection against particulate exposures. This is accomplished through experimental measurement of filter, exhalation valve, and facial seal leak performance as a function of particle size and flow rate and the use of these data in a computer model to predict overall performance for a respirator based on QNFT measured leakage, airborne particle size distribution, and the work rate of the wearer. This study has no direct relationship to the proposed study.

Los Alamos MRUC-90-4-C-84 Filter Performance Study

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University of California
Tobacco-Related Disease Research Program
Biographical Sketch (for each Professional)

William C. Hinds	Professor
Name	Title/Role in this Project

Education (begin with baccalaureate and include postdoctoral training)

Institution and Location	Field of Study	Degree	Year
Cornell Univ.; Ithaca, NY	Mech. Engineering	BME	1962
Harvard Univ.; Boston, MA	Air Pollution	MS in Hyg.	1969
Harvard Univ.; Boston, MA	Env. Health	ScD	1972

Professional Experience (begin with present position)

1989-Pres.	Chair, Dept. Environmental Health Sciences	UCLA School of Public Health
1987-89	Division Head, Environmental Health Sciences	UCLA School of Public Health
1986-Pres.	Professor of Environmental Health Sciences	UCLA School of Public Health
1982-86	Associate Professor of Public Health	UCLA School of Public Health
1980-82	Associate Professor of Environmental Health Engineering	Harvard University
1973-80	Assistant Professor Environmental Health Engineering	Harvard University

Publications (On an additional page, list in chronological order the titles and complete references of all articles published during the last 5 years; list all earlier publications that are pertinent to this application. (Use no more than one complete page for publications.)

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Phalen, R.F., Hinds, W.C., John, W., Liou, P.J., Lippmann, M., McCawley, M.A., Raabe, O.G., Soderholm, S.C., and Stuart, B.O., "Rationale and Recommendations for Particle Size-selective Sampling in the Workplace," Applied Ind. Hyg. J., **1**, 3-14 (1986).

Froines, J.R., Hinds, W.C., Duffy, R.M., LaFuente, E.J., and Liu, W.C.V., "Exposure of Firefighters to Diesel Emissions in Fire Stations," Am. Ind. Hyg. Assoc. J., **48**, 202-207 (1987).

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Hinds, W.C. and Kraske, G., "Performance of Dust Respirators with Facial Seal Leaks: I. Experimental," Am. Ind. Hyg. Assoc. J., **48**, 836-841 (1987).

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Hinds, W.C., "Basis for Particle Size-Selective Sampling for Wood Dust," Appl. Ind. Hyg., **3**, 67-72 (1988).

Hinds, W.C., and Bellin P., "Effect of Facial-seal Leaks on Protection Provided by Half-mask Respirators," Appl. Ind. Hyg., **3**, 158-164 (1988).

Other relevant publications

Hinds, W.C., and First, M.W., "Concentrations of Nicotine and Tobacco Smoke in Public Places," N.E.J. Med., **292**, 844 (1975).

Hinds, W.C., "Size Characteristics of Cigarette Smoke," Amer. Ind. Hyg. Assoc. J., **39**, 48-54 (1978).

Hinds, W., First, M.W., Huber, G.L., and Shea, J.W., "A Method for Measuring Respiratory Deposition of Cigarette Smoke During Smoking," Amer. Ind. Hyg. Assoc. J., **44**, 113-118 (1983).

University of California
Tobacco-Related Disease Research Program

Relevance of the Project/Facilities Available

Discuss the relevance of your proposed research to tobacco-related diseases in the State of California and what impact your research might have on these diseases and the California population at risk.

The proposed study is important because of the large number of lung cancers cases in California, 14,800 new cases in 1988 with 83% of these due to smoking, and the sizeable population of workers exposed to dusty environments (ACS, 1988). The socioeconomic conditions of these workers suggest that they have a high proportion of smokers, especially heavy smokers. Blue collar workers are more likely to be exposed to hazardous chemicals and to be in jobs associated with an increased risk of lung cancer. A higher percentage of nonwhites (23%) than whites (14%) work in occupations that have increased lung cancer risk (Surgeon General, 1979).

At present smoking is controlled in the workplace to reduce fire and explosion hazard and to a lesser extent to reduce exposure of nonsmokers to environmental tobacco smoke. The results of this study may provide a more direct basis for controlling smoking in the workplace, namely the increased health risk to the smoker due to smoking, occupational exposure, and their combination. If the hypothesis is found to be valid then this study will provide an improved basis for controlling the risk of lung cancer in occupational settings.

A.C.S. (1988) "Cancer facts & Figures 1988, "American Cancer Society, New York.

Surgeon General (1979) U.S.D.H.E.W., Public Health Service, Smoking and Health - A Report of the Surgeon General, Chapter 7, "Interactions Between Smoking and Occupational Exposures" Washington, DC (1979).

Facilities and Resources (Describe the facilities and resources that are needed and are available for successfully carrying out the proposed research.

Space: Aerosol Research Laboratory, CHS 56-051, 379ft²

Equipment: TSI Model APS 3310 Aerodynamic Particle Sizer, TSI Model 3050 Berglund-Liu Vibrating Orifice Monodisperse Aerosol Generator, TSI Model 3062 Diffusion Dryer, TSI Model 3054 Aerosol Neutralizer, Sierra Model 210 Ambient Cascade Impactor (one of two required), Applied Research Laboratories Model 3410 inductively coupled plasma atomic emission spectrometer (purchase approved for 1990), Cahn Model 25 Electrobalance, GCA Model RAM-1 Real-time Aerosol Monitor, Kurz Instruments Model 1440-4 Digital Air Velocity Meter, and AST Model 386SX/16 personal computer with 40 MB hard drive.

APPLICANT INSTITUTION PROFILE

Legal Name: Regents of the University of California

Date of Incorporation: 1868

Type of Institution (Higher Ed; Hospital; etc.) Higher education

Tax Exempt Status (IRS Code Number): IRS: 956006143W

Annual Budget: \$ In excess of one billion dollars

Name of External Auditor: Peat, Marwick, Main and Company

Date of Most Recent Audit: 6/30/89

Which Federal Agency approves your indirect cost rates? Dept. Health & Human Serv.

What is the date of your latest indirect cost rate negotiation agreement? 5/31/89

If your indirect cost rate is not federally approved, what is the basis for the rate proposed in your budget?

Business Officer with whom to negotiate award:

Name: Phil Costic

Title: Sr. Contract and Grant Officer

Office of Contract and Grant Administration
Address: 1400 PVUB, University of California, Los Angeles CA 90024

Telephone No.: (213) 825-0609

UNIVERSITY OF CALIFORNIA, LOS ANGELES

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SANTA BARBARA • SANTA CRUZ

1TR 0007 - 01

OFFICE OF CONTRACT AND GRANT ADMINISTRATION
405 HILGARD AVENUE
LOS ANGELES, CALIFORNIA 90024-1406

February 20, 1990

Tobacco-Related Disease Research Program
Office of Health Affairs-Office of the President
University of California, 764 University Hall
2199 Addison Street
Berkeley, CA 94720

SUBJECT: Proposal Submission

Ladies and Gentlemen:

On behalf of the Los Angeles campus, I am pleased to submit the enclosed proposal entitled "Interaction of Occupational Aerosols and Tobacco Smoke". This project will be conducted under the direction of Professor William Hinds in the UCLA School of Public Health between July 1, 1990 and June 30, 1993. We are requesting funds in the amount of \$194,078 for this period.

Your favorable consideration of this proposal would be appreciated. If you have any questions of a technical nature, please contact Professor Hinds at (213) 825-7152. If you have any questions of an administrative nature, please contact the undersigned at (213) 825-0609.

Sincerely,

A handwritten signature in dark ink, appearing to read "Philip E. Costic", written over a circular stamp or seal.

Philip E. Costic
Senior Contract and Grant
Officer

OJB0220B

Enclosures: Original plus 5 copies referenced proposal

cc w/o encl: Professor William Hinds
Ms. Jayne Rosenthal

2025792774

1TR 0007 - 01

RESEARCH AWARD APPLICATION

Circle Duration of proposed project:

(1)	(2)	<u>(3)</u>	years
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1990-91: \$71,109

Interaction of Occupational Aerosols and Tobacco Smoke

William C. Hinds, ScD

Name (first, last, degree(s))

Environmental Health Science
School of Public Health
10833 Le Conte Avenue
Los Angeles, CA 90024-1772

Department telephone

Office telephone

Message telephone

Fax telephone

RECEIVED
FEB 21 1990

Ans'd.....

Mailing Address of Official signing for Applicant Organization

Philip Costic.

Senior Contract and Grants Officer

Name

Title

Address

Los Angeles, CA

90024-1406

City

State

Zip Code

2025792775

Co-Investigators (Professional)

Name (first, last, degree(s))

Position/Title

Mailing address of Co-Investigator:

Department telephone

Office telephone

Message telephone

Fax telephone

Reviews and Approvals

(A) Human Subjects

☒ Does not apply
☐ Approval attached
☐ Review pending;
expected date of
approval_____

(B) Animal Subjects

☒ Does not apply
☐ Approval attached
☐ Review pending;
expected date of
approval_____

(C) Biohazards

☒ Does not apply
☐ Approval attached
☐ Review pending;
expected date of
approval_____

2025792776

University of California
Tobacco-Related Disease Research Program

Verifications:

(A) Applicant:

I verify that the information that I have provided in this application is correct and complete. If given an award, I will abide by all relevant policies and procedures of the University of California Tobacco-Related Disease Research Program, including the provision of required progress reports and other project-related reports.

<u>William C. Hind</u>	<u>2/13/90</u>
Signature	Date

(B) Contracts and Grants/Authorized Fiscal Official:

I certify that the statements made herein are true and complete to the best of my knowledge and I accept the obligation to comply with the relevant terms and conditions of the grant as established by the Tobacco-Related Disease Research Program.

<u>Philip Costic</u>	<u>2/20/90</u>	Philip Costic, Senior Contract and Grants Officer	
Signature	Date	Name	Title

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